# Mohave County Miner.

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### *Luckenback Process.*

By Frank Hall.

This method of pulverizing ores and varieties of hard rock, which is now attracting much attention from mining men, was invented in New York in 1881-2 by Frederick A. Luckenbach & Son, both experienced mechanical engineers with a natural penchant for invention. Until a recent date it was not especially applied to the reduction of gold and silver ores, and even now until further devices to that end shall have been matured, is not adapted to the extraction of silver except as it may exist in chemical combination with gold.

Since 1882 it has been extensively used in Europe and the United States for pulverizing raw flints for china-ware, chromo iron and red oxide of iron for paints, broken glass for soaps, portland cements, talc, phosphate rock, charcoal, flint, magnetic sand, silex, etc., and by the rapidity and perfection of its work superceding other appliances. Recognizing the demand for its employment in the Western mining fields, the Messrs. Luckenbach came to Denver early in the current year and here established a plant, adding a "hydrogen fine gold saving trap" for the effective amalgamation of free gold ores, which it is claimed excels and saves, after treatment by the pulverizer, from 90 to 95 per cent. of the precious contents of such ores. They are not yet prepared to extract silver, but since about March 1st have been engaged in preparing, in connection with free milling gold ores, sample lots of from one to five tons of dry silver bearing minerals for concentration, lixivation chlorination, roasting, etc., and testing their value. Since its cheapness and its efficiency became widely known, applications have been continuous, and all who have witnessed its operation express surprise at its simplicity and evident superiority over any other existing form of reduction. Since its introduction here several parts of the original process have been materially changed, and thereby decidedly improved, but the sectional drawings are not yet completed, hence we are unable to illustrate the apparatus. Without such drawings it is difficult to set forth the mechanical construction in a manner to be clearly comprehended by the average reader, hence we shall not now attempt anything beyond a general review of the metallurgical branch whereby results are obtained.

To begin with, there is no grinding, no ponderous, heavy or complex machinery. The entire scheme is the perfection of simplicity, combined with lightness and durability. The ore is crushed in an ordinary Dodge cracker, screened and fed into a receiver near the top of a pulverizer, about eighteen feet above the floor, whence it decends in carefully regulated volume of supply into a small oblong iron receptacle, where it is brought in contact with two small but powerful opposing jets of super-heated steam, which reduces it to any required fineness, even to an inpalpable powder, leaving it dry and hot, the degree being regulated by a small hand valve on the outside. After being fed into the rock-breaker the entire operation is automatic, there is very little noise, no jarring, no friction, except as hereinafter described. The principle consists in subjecting the minerals to the two opposing currents of superheated steam just mentioned, whereby the particles are thrown with great force against each other and thus completely disintegrated. The high temperature of the steam currents through which every particle of the ore must pass causes them to become very hot, which, supplemented by the concussion—in gold ores—scours and liberates the coated or rusty atoms so that when passed into the hydrogen amalgamating trap containing a large bath of quicksilver, which is kept clean and healthy by hydrogen gas, the largest possible saving of gold is effected.

In most other methods of crushing and pulverising, the wear of machinery is very great, and consequently very expensive. Here, however the only part subject to any material wear are two small iron tubes, through which the steam currents charged with ore continuously pass to the point of concussion. But the cost of these tubes is only ten cents a pair, each weighing one pound, and lasting from six to nine hours. They may be taken out and replaced within three minutes. Again the cost of strong rock or brick foundations for other pulverizers is a material factor in their construction. Here no foundation but a level floor of boards or earth is required. The pulverizers, always in connected pairs, though they may be operated singly weigh only 2,000 pounds per pair, each occupying no greater space than a medium-sized base burner stove, and the furnace for superheating the steam about the same. In the latter, ordinary soft coal, wood or coke may be used. No large or expensive buildings are needed.

Mr. Luckenbach advises that when a large plant to reduce 100 to 200 tons, a day is desired, a set of Cornish rolls be added to the Dodge cracker. While not absolutely necessary, it would facilitate rapid pulverizing.

The cost of reducing and amalgamating free gold ores—there being no appreciable loss of quick-silver—is 50 cents to $1 50 per ton, according to the capacity of the milling power employed. Each pair of mills will reduce ten tons in twenty-four hours. It may be increased to any extent by the duplication of machines, the cost of the latter being about $2,500 a pair, exclusive of ore-breaker and steam power. The hydrogen gold saving trap, with appliances, weighs 1,000 pounds; the whole apparatus made in small sections so that if necessary it may be packed on mules or over rough mountain trails and roads.

As to manual labor, but three men are required to run a plant of fifty tons capacity; one on the breaker, another at the pulverizer and an engineer. After the ore is delivered to the pulverizer no further attention is needed. The dry products designed for other treatment than amalgamation are conveyed by pneumatic tubes into a dust chamber especially provided for them; those intended for the hydrogen amalgamators are automatically converted into pulp which descends by its own gravity from a point ten or twelve feet above the pulverizer into the trap, which is composed of two deep circular pans about three feet in diameter, fitted with screws and setting one within the other about one and one-half inches apart. Beneath them is a large body of quick-silver, from beneath and through which the pulp is injected in fully subdivided currents, thus securing direct control of all, even the infinitesmal particles of flour or float gold with the mercury. Thus it is almost impossible to conceive how any of the gold can escape. Indeed, the saving seems to be complete. The pans have no motion whatever. Instead of being cast into the top and sides as in other methods of panning and grinding with mullers and pulps, the pulp enters from the bottom. The interval between the pans being filled with water, the overflow carries off the refuse matter into tanks for further analysis if desired.

Mr. Luckenbach recommends the sectional safety water tube boiler because of its durability, safety and economy. The firm is prepared to furnish plants of any capacity. The pulverizers have been in operation for the past three months, testing sample lots of ore from this and other states. Each day brings numerous visitors to examine them. Many applications have been received and negotiations are pending for several large plants in Utah, Montana, Wyoming, Colorado, Idaho and New Mexico. The managers make it an invariable rule to test all ores sent them with a view to discovering whether the method of treatment is adaptable to them before any proposition for machines will be entertained. They cordially invite applicants to supervise the milling of their ores.—Mining Age, Salt Lake City, Utah.

### *The Baby and the Savage.*

In the bone caves of the south of France have been found figures of reindeer, mammoths and men scratched on horn or ivory, and evidently executed by artists contemporary with the Elephas primi-genius. The men are represented with short, bent legs, and seem to stand or walk in a stooping manner, with the body bowed slightly forward from the hips. Now press your hand down the back of any infant of under ten months old and feel the spine at the loin or lumbar region, where in the adult modern man the back is hollow or concave. You will observe that in the babe it is convex like that of a quadruped (a ten months-old baby is practically a quadruped), and though the child can perhaps get on its legs with the support of a chair, it does not straighten its thighs and stand upright, but is bent forward in the same posture of the cave dweller whose portrait has come down to us from the age just succeeding the last glacial epoch. If the support is removed the child falls forward, and again becomes a pseudo-quadruped.—Blackwood's Magazine.

### *San Francisco in 1848.*

In 1848, just before gold had been discovered in California, the city of San Francisco had a population of 850 all told and consisted of about 200 wooden buildings. In the spring of 1848 there began to be rumors of gold discoveries in the foothills of the Sierra Nevadas, and presently actual miners appeared in town showing small parcels of gold dust. Then came an era of wild speculation and extravagant prices. Common laborers were getting ten dollars a day and ordinary mechanics twenty dollars; men who had lived on five dollars a month now spent hundreds; men who had been idlers formerly were now among the most industrious, and men who had never before wasted a day became loungers and gamblers. The mad scramble for wealth manifested itself on all sides. In the first six months of 1849, 15,000 souls were added to the population of San Francisco, and by the end of the year the Pacific coast metropolis had over 25,000.

And how did they all live? In frame houses of one story, more commonly in board shanties and canvas tents, pitched in the midst of sand or mud and various rubbish and strange filth and fleas, and they slept on rude cots, or on "soft planks" under horse blankets, on tables, counters, floors, on trucks in the open air, in bunks braced against the weather boarding, forty of them in one loft; and so they tossed and scratched and swore and laughed and sang and skylarked.—Edward Rosewater's Omaha Address.

### *A Murder Case That's a Puzzler.*

A most remarkable, if not unexampled murder case soon comes up in the Warren county (O.) criminal court. Harley Dodds, a deaf mute, aged about thirty, will be put on trial for murdering his brother Milton Dodds, last February. The deaf man had served two terms in the penitentiary for stealing. The fratricide was living with a notorious woman in the hamlet of Mount Holly, near Waynesville. She claimed to be his wife, but was not. She has been imprisoned twice for horse stealing. "Dummy," as Harley is dubbed, cannot read or write, nor does he know one single letter of the mute's alphabet. Thus he has never been able to give his version of the story, and the great difficulty of the lawyer appointed to defend him will be to get some one who can interpret the few signs by which he makes his wants known. His mother can understand some, but she would be a prejudiced witness in his favor, and the court could not accept her. The law presumes that he shall have knowledge of the testimony against him, and testify in his own defense. How this can be done is a puzzle. He certainly knows no more than an animal, and his conviction by a jury which could not understand his defense might be reversed and the man set free.

### *Fencing Out Rabbits.*

An extraordinary story illustrating the difficulty of fencing against rabbits comes from Victoria. The proprietors of an estate of 13,000 acres determined to fence in the whole of the land, and to destroy the rabbits inside. They erected a stone wall 5 feet six inches high from the surface of the soil and sunk 18 inches beneath, with a board projecting 6 inches outward from the top. But when the rabbits had been cleared off inside, starving animals managed to get over from the outside, to feed on the grass which had grown nicely. Next, the proprietors lowered the height of the stone wall, and put wire netting 2 feet six inches high, upright on top. The cunning little rodents however, ran up the stone work, and, using the meshes of the netting as steps, climbed over the wire work. A third trial was made, the wire netting being made to slant outwards at an angle of 45 degrees, and this proved successful, as the rabbits were unable to climb the leaning wire. Over £3,000 had been spent when success was at last obtained.—Exchange.

### *His Shocking Blunder.*

He is one of those youths who seem brighter than they really are. He had never clerked in a dry goods and furnishing store, but his favorable appearance and indorsements concerning his honesty secured him a position. He was to act as assistant to the gentleman in charge of the ladies' hosiery department. The second day after he begun work the clerk in charge of the counter was ill, and failed to put in an appearance. The new man felt that he was fully competent to run the business.

A very beautiful young lady approached him and remarked:

"I bought some stockings of the gentleman in charge of this department yesterday, and, if you please, I should like to change them."

There was something about the young lady's beauty that facinated and bewildered him as he hastily responded:

"Er—yee'm; but I presume you had better not attempt to here. The ladies' toilet and waiting rooms are on the next floor above."

Of course, his incivilty was reported, and he was discharged, and all because he was so impressible and absent minded.—Chicago Times.

A letter received in Tucson early this week from Ariyaca containing the information that two Mexicans had been found hanging from the limb of a tree near there a short while since. Considerable cattle have been stolen in that section of the country for some time past and it is believed that the two men who met such a fate were suspected of doing the stealing and were put out of the way. If such belief was well grounded, it was, perhaps the most effective way to make a long programme short, and at the same time set a wholesome example for others, who might want to make cattle stealing a means of making a comparatively easy living. Arizona is practically free from such characters, and a little hemp-stretching party, as above, will have a tendency to keep her so.—Stockman.

Bob Ford wore an opal ring which had been taken from a Kansas City man after his murder and the last night of his life slept in room 30 at the Tortoni. In newspapering "30" means "the last." You fatallists can make the most of this.—Creede Candle.